



Public Works and  
Government Services  
Canada

Travaux publics et  
Services gouvernementaux  
Canada

Suite 204, 1 Regent Square  
Corner Brook, NL  
A2H 7K6

August 5, 2015

Environmental Protection Officer  
C/O Courtney Hunt  
Service NL

**RE: Basin dredging, Newman Sound (Terra Nova National Park Headquarters Wharf).  
NL, P/N R.0072196.004**

On behalf of Parks Canada – Terra Nova National Park, please find below a project description and relevant information for the above-referenced project. Subject to regulatory approval, it is proposed to dispose of the dredged material at a provincially approved waste disposal site.

#### **1.0 Project Description:**

The proposed dredging is required to remove an excess accumulation of sediment within the main boat basin and wharf berthing areas. The sediment will be removed as part of a larger wharf reconstruction project.

At a maximum, approximately two thousand two hundred and fifty cubic metres (2250 m<sup>3</sup>) of primarily sand-pebble material will be excavated from the proposed site. The proposed dredging will likely be completed in a single phase over a period of 1-2 days through the use of a long reach, land-based track excavator/backhoe working from the surrounding shoreline.

Dredge material will be loaded into watertight dump trucks and pending Service NL approval, will be transported out of Terra Nova National Park for disposal at a provincially approved waste disposal site.

#### **2.0 Marine Sediment Sampling Program**

As part of this project's pre-planning process, three (3) marine sediment samples were collected from the target dredge area at a depth of four to ten centimetres below the surface and submitted for chemical analysis. The purpose of the sampling was to identify contaminants of concern within the dredge area and to ensure compliance with all provincial and federal guidelines related to potential land-based disposal of dredged materials.

In accordance with the Environment Canada (1994): Environmental protection series – *Guidance Document On Collection And Preparation Of Sediments For Physicochemical Characterization And Biological Testing* (Report EPS 1/RM/29), three (3) samples were determined to adequately represent the volume of material to be dredged. Samples were collected by PWGSC personnel from randomly selected locations within the proposed dredge

**Canada** 



area on November 18, 2014. As per laboratory protocol, each sample consisted of 2 -250 ml jars and were stored inside coolers with ice (maximum temperature: 4°C), and were delivered to Maxxam Analytics Inc., a CALA certified facility, in St. John's, NL, for selected chemical analyses. Field quality control and field quality assurance programs were adhered to in the sampling exercise. Refer to attached site plan for approximate location of collected samples.

Sediment samples were analyzed for metals including, but not limited to, arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel; polyaromatic hydrocarbons (PAHs); polychlorinated biphenyls (PCBs); benzene, toluene, ethylbenzene, and xylene (BTEX); and total petroleum hydrocarbons (TPHs). A copy of the complete chemical analysis may be found appended to this application (*Maxxam Job #: B4L8120*).

Sediment samples were compared with *CCME Soil Quality Guidelines for the Protection of Environmental and Human Health*, (Soil Update 7.0: September 2007) and the *CCME Soil Quality Guidelines for the Protection of Environmental and Human Health: Polycyclic Aromatic Hydrocarbons* (2010).

### 3.0 Sediment Sampling Analytical Results:

The three (3) sediment samples analyzed revealed:

- All samples tested within *CCME Industrial Soil Quality Guidelines*, (Soil Update 7.0: September 2007), Table 1;
- All samples tested within *CCME Human health guidelines based on carcinogenic effects of PAH's: Polycyclic Aromatic Hydrocarbons* (2010) Table 1; \*SQG based on incremental lifetime cancer risk (ILCR) of  $10^{-5}$ ;
- All samples tested within *CCME Environmental health guidelines for an industrial site: Polycyclic Aromatic Hydrocarbons* (2010) Table 2;
- BTEX/TPH were not detected in any of the samples.
- PCB's were not detected in any of the samples.

The complete set of analytical results, including QA/QC and Certificates of Analyses for all parameters for which there are established regulatory guidelines are provided in the attached appendices.

I trust the enclosed information is sufficient to provide the necessary approval. If you have any questions or concerns, or require any additional information of further clarification please contact me at (709) 637-4481.

Regards,

Mark McNeil, Environmental Specialist  
PWGSC-ES



Public Works and  
Government Services  
Canada

Travaux publics et  
Services gouvernementaux  
Canada

Attachments:

Google Earth image (identifying target dredge area)

Site Plan (identifying sediment sample locations)

"Summary Tables of the Laboratory Analysis"

"Select Parameters"

"Certificate of Analysis- Maxxam Job #: B4L8120"

**Privilege and Confidentiality Notice:** The information in this letter is intended for the named recipients on the original letter at the time it was prepared. It may contain privileged and confidential information. Any use of this information by third parties requires the written consent of PWGSC. All findings and conclusions stated in this letter are based on facts and circumstances, as they existed at the time this letter was prepared. This report is not intended to be exhaustive in scope and any change in fact or circumstance upon which this report is based may affect the expressed findings and conclusion.



Public Works and  
Government Services  
Canada

Travaux publics et  
Services gouvernementaux  
Canada

## Google Earth Overview



Public Works and  
Government Services  
Canada

Travaux publics et  
Services gouvernementaux  
Canada



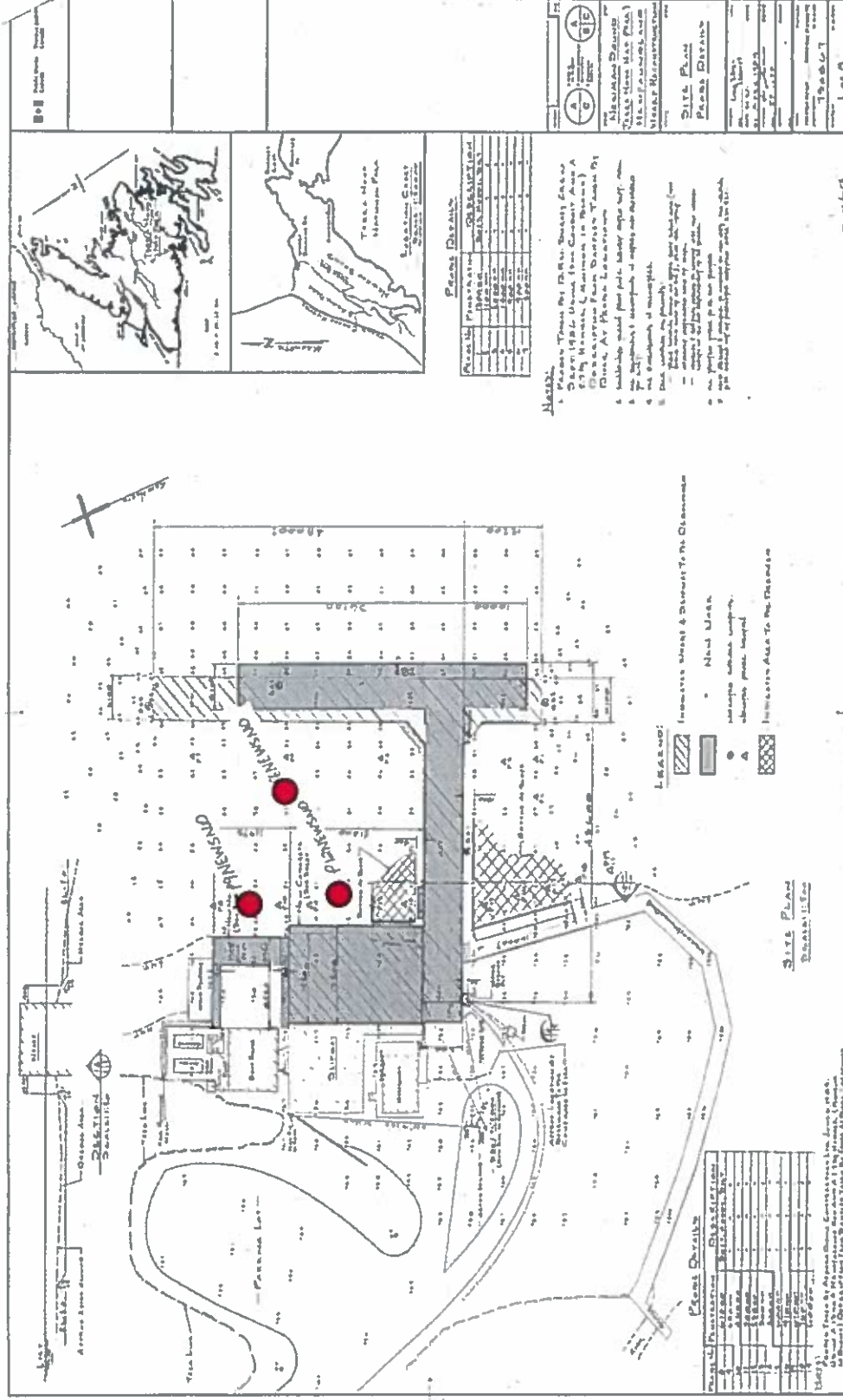
Aerial overview of proposed target dredge area (yellow) at the Newman Sound, Headquarters Wharf located in Terra Nova National Park, NL



Public Works and  
Government Services  
Canada

Travaux publics et  
Services gouvernementaux  
Canada

### Site Plan (sample locations)



Approximate sample locations



Public Works and  
Government Services  
Canada

Travaux publics et  
Services gouvernementaux  
Canada

## Summary Tables of the Laboratory Analysis





Sample ID Laboratory ID Maxxam Job #	Guideline 4. CCME Soil Industrial	DETECTION LIMIT	Units	P6NEWSND YN0840 B4L8120	P9NEWSND YN0845 B4L8120	P12NEWSND YN0846 B4L8120
Sampling Date	Coarse Grained			18-November-2014	18-November-2014	18-November-2014
Arsenic	12	2.0	mg/kg	7	3.3	2.4
Barium	2000	5.0	mg/kg	9.8	8.9	8.2
Cadmium	22	0.30	mg/kg	1.4	0.6	ND
Chromium	87	2.0	mg/kg	16	10	9.1
Hexavalent chromium (VI)	1.4	-	-			
Copper	91	2.0	mg/kg	23	12	8.4
Cyanide (free)	8	0.01	mg/kg	0.22	0.02	0.02
Lead	600	0.50	mg/kg	19	6.8	4.5
Mercury	50	0.10	mg/kg	ND	ND	ND
Nickel	50	2.0	mg/kg	9	6.4	5.2
Selenium	2.9	1.0	mg/kg	1.3	ND	ND
Thallium	1	0.10	mg/kg	0.26	0.14	ND
Uranium	300	0.10	mg/kg	10	4.2	0.96
Vanadium	130	2.0	mg/kg	36	24	20
Zinc	360	5.0	mg/kg	38	25	19
Aluminum	NV	10	mg/kg	3900	3800	4500
Antimony	NV	2.0	mg/kg	ND	ND	ND
Beryllium	NV	2.0	mg/kg	ND	ND	ND
Boron (hot water soluble)	NV	-	-			
Boron (total)	NV	50	mg/kg	510	220	ND
Cobalt	NV	1.0	mg/kg	2.9	3.2	3.4
Cyanide (total)	NV	-	-			
Iron	NV	50	mg/kg	11000	9500	10000
Manganese	NV	2.0	mg/kg	62	120	140
Methylmercury	NV	-	-			
Molybdenum	NV	2.0	mg/kg	30	12	ND
Silver	NV	0.50	mg/kg	ND	ND	ND
Strontium	NV	5.0	mg/kg	150	70	21
Tin	NV	2.0	mg/kg	ND	ND	ND

Metals results for Newman Sound.

Sample ID Laboratory ID Maxxam Job #	Guideline 4. CCME Soil Industrial	DETECTION LIMIT	P6NEWSND YN0840 B4L8120	P9NEWSND YN0845 B4L8120	P12NEWSND YN0846 B4L8120
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Sampling Date	Coarse Grained		18-November-2014	18-November-2014	18-November-2014
Aroclor 1254	NV	0.010	ND	ND	ND
DODs	NV	-			
DDEs	NV	-			
DDTs	NV	-			
DDT (Total incl. Metabolites)	12	-			
Dieldrin	NV	-			
Endrin	NV	-			
Heptachlor epoxide	NV	-			
Lindane (Hexachlorocyclohexane)	NV	-			
PCBs (total)	33	0.010	ND	ND	ND

PCB results for Newman Sound.



Sample ID	Guideline	DETECTION LIMIT	P6NEWSND	P9NEWSND	P12NEWSND
Laboratory ID	8. CCME Soil		YN0840	YN0845	YN0846
Maxxam Job #	Industrial		B4L8120	B4L8120	B4L8120
Units	mg/kg	mg/kg		mg/kg	mg/kg
Sampling Date	Coarse Grained		18-November-2014	18-November-2014	18-November-2014
Benzene	0.03	0.025	ND	ND	ND
Ethylbenzene	0.082	0.025	ND	ND	ND
Hexane	6.5	-			
Modified TPH1 (Tier 1)	NV	15	360	100	180
Toluene	0.37	0.025	ND	ND	ND
Xylenes	11	0.050	ND	ND	ND
Total TPH	NV	-			

TPH/BTEX results for Newman Sound.

Ingestion, inhalation, dermal exposure (carcinogenic)	B[a]P PEF (multiplier)	P6NEWSND	P9NEWSND	P12NEWSND
Benzo(a)anthracene	mg/kg 0.1	0.062	0.0062	0.0082
Benzo(a)pyrene	mg/kg 1	0.000	0.0025	0.0025
Benzo(b)fluoranthene	mg/kg 0.1	0.052	0.0052	0.0066
Benzo(g,h,i)perylene	mg/kg 0.01	0.000	0.000025	0.000025
Benzo(k)fluoranthene	mg/kg 0.1	0.000	0.00025	0.00025
Chrysene	mg/kg 0.01	0.059	0.00059	0.0092
Dibenz(a,h)anthracene	mg/kg 1	0.000	0.0025	0.0025
Indeno(1,2,3-cd)pyrene	mg/kg 0.1	0.000	0.00025	0.00025
<b>Total B[a]P TPE must be less than 0.6 or 5.3 (corresponding to 10<sup>-6</sup> or 10<sup>-5</sup> risk levels)</b>			<b>0.017515</b>	<b>0.021245</b>

Carcinogenic PAH results (Human Health).



Polyaromatic Hydrocarbons	Units	Agricultural	Residential	Commercial	Industrial	Reference/Limiting pathway	If impact to surface water is not a concern, may also use	Reference/Tier II Limiting pathway	P6NEWSND	P9NEWSND	P12NEWSND
1-Methylnaphthalene	mg/kg	-	-	-	-	-	-	-	ND	ND	ND
2-Methylnaphthalene	mg/kg	-	-	-	-	-	-	-	ND	ND	ND
Acenaphthene	mg/kg	0.28	0.28	0.28	0.28	ccme 2010 (protection of freshwater life)	21.5	ccme 2010 (ingestion)	0.064	ND	ND
Acenaphthylene	mg/kg	320	320	320	320	ccme 2010 (protection of freshwater life)	-	-	ND	ND	ND
Anthracene	mg/kg	2.5	2.5	32	32	ccme 2010 (tail contact)	-	-	0.1	ND	ND
Benzo(a)anthracene	mg/kg	0.1	1	10	10	ccme 1991 (interim)	-	-	0.062	ND	0.03
Benzo(a)pyrene	mg/kg	20	20	72	72	ccme 2010 (tail contact)	-	-	ND	ND	0.025
Benzo(b)fluoranthene	mg/kg	0.1	1	10	10	ccme 1991 (interim)	-	-	0.052	ND	0.023
Benzo(g,h,i)perylene	mg/kg	-	-	-	-	-	-	-	ND	ND	0.013
Benzo(k)fluoranthene	mg/kg	0.1	1	10	10	ccme 1991 (interim)	-	-	ND	ND	0.014
Chrysene	mg/kg	6.2	6.2	-	-	ccme 2010 (ingestion)	-	-	0.059	ND	0.033
Dibenz(a,h)anthracene	mg/kg	0.1	1	10	10	ccme 1991 (interim)	-	-	ND	ND	ND
Fluoranthene	mg/kg	50	50	180	180	ccme 2010 (tail contact)	-	-	0.3	0.053	0.058
Indene(1,2,3-cd)pyrene	mg/kg	0.25	0.25	0.25	0.25	ccme 2010 (protection of freshwater life)	15.4	ccme 2010 (ingestion)	0.12	ND	ND
Naphthalene	mg/kg	0.1	1	10	10	ccme 1991 (interim)	-	-	ND	ND	0.012
Perylene	mg/kg	0.013	0.013	0.013	0.013	ccme 2010 (protection of freshwater life)	0.6 mg/kg, 22 cm/min	ccme 1997 (provisional)	ND	ND	ND
Phenanthrene	mg/kg	-	-	-	-	-	-	-	0.45	0.049	0.033
Pyrene	mg/kg	0.046	0.046	0.046	0.046	ccme 2010 (protection of freshwater life)	0.1, 5, 50, 50	ccme 1991 (interim)	0.064	ND	0.018
	mg/kg	0.1	10	100	100	ccme 1991 (interim)	-	-	0.31	0.035	0.075

PAH results (Environmental Health).



Public Works and  
Government Services  
Canada

Travaux publics et  
Services gouvernementaux  
Canada

Select Parameters from Table 2 – Interim Remediation Criteria



**CCME Canadian Soil Quality Guidelines Update 7.0 (Interim Remediation Criteria - Table 2)**

Inorganics (Metals)	Guidelines	Results			
		P6NEWSND	P9NEWSND	P12NEWSND	
Antimony	40 mg/kg	ND	ND	ND	
Beryllium	8 mg/kg	ND	ND	ND	
Cobalt	300 mg/kg	2.9	3.2	3.4	
Molybdenum	40 mg/kg	30	12	ND	
Silver	40 mg/kg	ND	ND	ND	
Tin	300 mg/kg	ND	ND	ND	



Public Works and  
Government Services  
Canada

Travaux publics et  
Services gouvernementaux  
Canada

Certificate of Analysis- Maxxam Job #: *B4L8120*  
(Attached separately)

Canada